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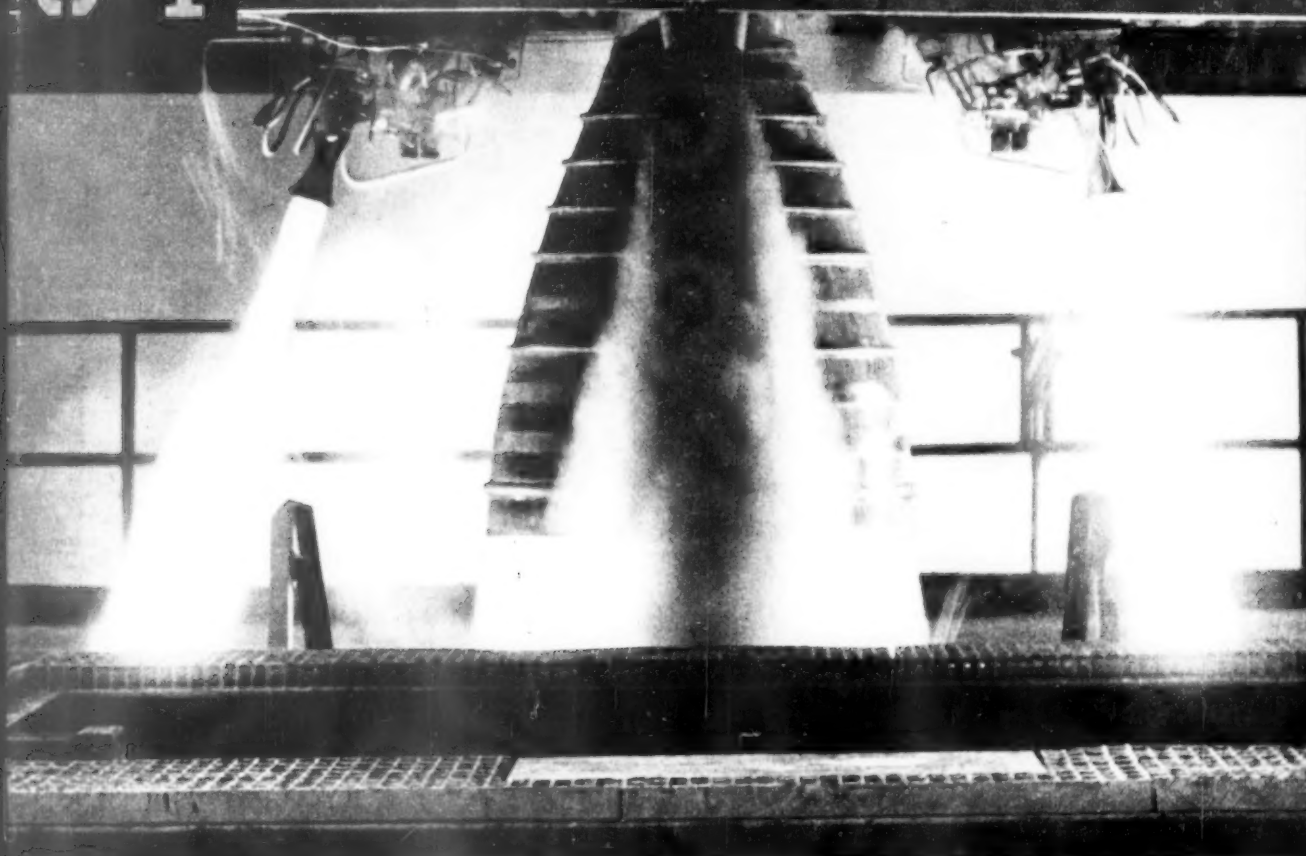
November 1, 1958

VOL. 74 NO. 18

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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



**Moon Motor**

See page 279

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## MEDICINE

# Drugs Fight Mental Ills

The consensus of psychiatrists, selected from the membership of the American Psychiatric Association, is that tranquilizers are an important advance in treating the mentally ill.

► TRANQUILIZING DRUGS are a major advance in the treatment of mental illness and the alleviating of the major medical and social problem of maintaining mental health.

This is the opinion of psychiatrists selected from the membership of the American Psychiatric Association and asked to answer, anonymously, questions in a SCIENCE SERVICE Grand Jury inquiry. Approximately one percent of the 10,000 members were chosen methodically and polled to give good distribution throughout the nation. More than half responded.

There was an overwhelming affirmative answer to statement: "Significant progress is being made in mental disease treatment." The vote was: "Yes" 89% (47); "no" 9% (5); not voting, 2% (1).

As to whether tranquilizing drugs are a major advance, the poll showed: "Yes" 66% (35); "no" 28% (15); not voting, 6% (3).

When asked if, as a consequence of the new advances, mental hospital admissions will decrease in the future, the experts answered: "Yes" 45% (24); "no" 34% (18); not voting, 21% (11).

Looking into the future, the experts were asked if an as-yet-unknown chemical cure or cures for major mental illness will be found. The opinion was about evenly divided, with 47% (25) answering "no," 45% (24) answering "yes" and 8% (4) not voting.

Of those who believed that new cures might be found for major mental illness and were willing to guess when, 73% (16) judged that this is likely to occur before

1975. Only 9% (2) believed that such an advance might come before 1960, while 18% (4) gave as their judgment before 2000.

In the opinions of some experts who offered comments, the tranquilizers are not viewed as a "cure" but a useful advance in the management of psychotic patients.

One psychiatrist said they are a major step in helping treat grossly psychotic people, and that they convert the symptoms from a totally incapacitating illness to one more socially acceptable, but not more acceptable to the patient himself.

"Tranquilizers make the patient more comfortable and easier to live with in certain cases," another psychiatrist said, "but do not affect the mental disease process."

Another comment was:

"Not until all the etiological factors of both causation and pathology are determined, and not until the integrated efforts of the medical, social and psycho-social fields are implemented by combined political effort, will truly significant major progress occur."

Several psychiatrists pointed out that past life has a major influence in mental diseases which, as one observed, "are caused by emotional conflicts germinated at childhood and activated by the stresses of adolescence and later life." "Obsessing entities" and "the influence of past life memories on the present personality" were cited as major causes by another psychiatrist.

Chemistry may sedate or tranquilize but treatment essentially will remain as the adjustment of the individual by psychotherapy, was another expert's comment.

Another expert did not see how the

introduction of a chemical will modify a mental disorder any more than any injected substance could cause a man to change his religious beliefs or his political affirmations.

Among those who did not believe that mental hospital admissions would decrease, the following reasons were given:

The increase of our general population and the higher quota of aging people will ultimately result in more mental hospital beds required.

Perhaps beds for younger patients will be less needed but the older people will fill them up.

Psychiatrists who did not believe that chemical cures for mental illnesses would be found commented as follows:

The root of the mental disease problem is not chemical or physiological, and the drugs are only a solution to hospital logistics.

No chemical will bring about "cures" in illnesses with such complex etiology.

Mental illness has too many complex social and biologic roots to be cured by chemicals alone.

Science News Letter, November 1, 1958

## OPTICS

## Lighthouse-Like Lens Helps Near-Blind See

► THE LIGHTHOUSE has provided a clue to bringing vision to the near blind.

A unique kind of eyeglass with lenses similar to the ones found in lighthouses may bring vision to some of the nation's 500,000 partially blind persons.

The new triple-duty, tri-optic lens that has a magnification range of from 300% to 2,000% was described to scientists at the Western New York Society of Optometrists meeting in Buffalo. Dr. William Feinbloom, a consultant in sub-normal vision to the Optometric Center, New York, said the lens has been successfully used by 281 patients.

The eyeglass design was made possible by the incorporation of the Fresnel principle in three separate viewing sectors within a single lens. It fits standard eyeglass frames.

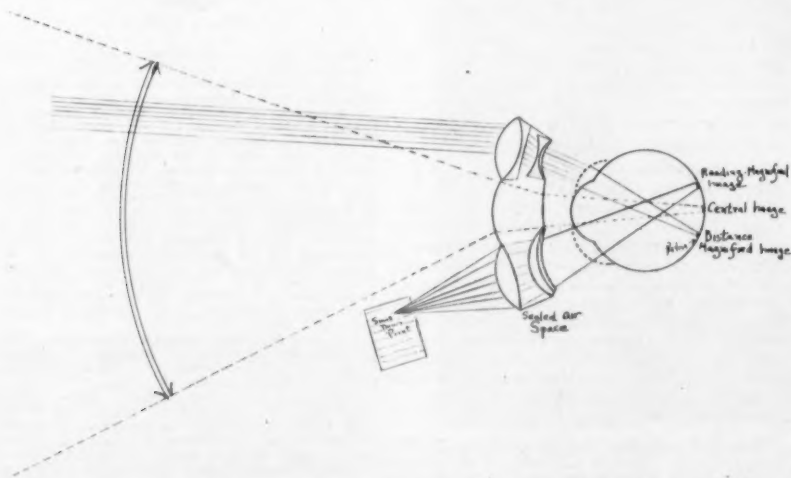
"The overall lens is made of clear, transparent plastic," Dr. Feinbloom said. "Embedded as the upper sector is a multiple lens system of eight optical surfaces that focus at infinity and produce 300% magnification.

"The center has two plastic curved surfaces and varied thickness to provide a full 120-degree field of vision so as to permit traveling about freely.

"The lower sector is a compound lens system, also embedded in the overall plastic lens. It is made up of from four to six lens surfaces with an air space, and produces up to 2,000% magnification for reading."

With the new system, the scientist explained, the partially blind eye performs like a normal one. Many of the young children fitted with the eyeglasses have been able to return to regular schools. Persons with partial blindness associated with diabetes, cataracts, high myopia and congenital causes have been restored to many of their normal activities, Dr. Feinbloom said.

Science News Letter, November 1, 1958



**TRI-OPTIC LENS**—The diagram shows the various fields of vision in which the new lens operates.



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Science News Letter, November 1, 1958

## SCIENCE NEWS LETTER

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Edited by WATSON DAVIS

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## ASTRONAUTICS

# Design Space "Sailboat"

► A SAIL one ten-thousandth of an inch thick, larger in area than the Pentagon, yet "blown" by less than one-half pound in solar energy has been advanced as the cheapest, simplest and lightest means of propulsion for the exploration of space.

Dr. T. C. Tsu, aerodynamicist at the Westinghouse Research Laboratories, Pittsburgh, reported the sail would be attached by shroud lines to a gondola carrying a payload and crew. The whole ship would resemble a huge, flat-top parachute.

The sail would be made of aluminum foil or lightweight plastic, and be propelled by the extremely slight amount of pressure the sun is known to exert when it shines on a body.

Dr. Tsu, developer of the sail, estimates the weight of such a sail would be about 800 pounds if the weight of the payload were 1,000 pounds. Not only could the sail serve as a means of propulsion but it could be used as a long-range radar antenna and a radiation sweeper to remove radioactive materials found in space.

The solar sailboat would have to be launched from the earth by means of a conventional rocket. Once in orbit, how-

ever, the rocket would be discarded, the sail could be unfurled and space travel would continue with no further dependence on fuel.

Trips to nearby planets would be faster for such a sail ship than it would be for chemical rockets, Dr. Tsu claims. This is because a chemical rocket exerts a large force for a short time, whereas a solar sail is pushed by a small force for a long time.

Thus, a one-way trip to Mars, according to Dr. Tsu, would take 118 days by solar sail, but 260 days by chemical rocket. A solar sailboat could get there quicker despite the fact that it would take it several weeks to escape from the earth's gravitational pull and an additional few weeks to penetrate the gravity of Mars.

Travel to distant planets, however, would be slower as the solar sailboat would be delayed en route by having to revolve around the sun.

The solar boat could sail into the sun or away from the sun in much the same way as an ordinary sailboat can move into or away from the wind.

Science News Letter, November 1, 1958

## ENGINEERING

# Motor Works at Fiery Heat

► AN ELECTRICAL insulation material enabling motors, transformers and other electrical equipment to be operated and do useful work at literally red-hot temperatures was demonstrated at the Westinghouse Research Laboratories in Pittsburgh.

A motor heated to a temperature of 1,200 degrees Fahrenheit and giving off a steady bright red glow was operated for several minutes at 1,800 revolutions per minute. Other motors built with the new insulator have been operated at temperatures ranging from 950 to 1,000 degrees for appreciable lengths of time, one of them for more than 100 hours. These are believed to be the first workable motors able to withstand such high heat without artificial cooling.

The insulating substance, called "Hot Rock," is inorganic, has good thermal stability, and consists of Fiberglas impregnated with a phosphate material. It is flexible and easily placed.

The material was developed by a team of four Westinghouse scientists headed by Dr. E. J. Croop. The others were C. H. Vondracek, D. C. Westervelt and C. F. Hoffman. They believe Hot Rock is "a candidate for space age insulation."

The insulating material could have widespread application in supersonic jet flights, missiles and rockets. It could also be used in household appliances such as refrigerators and washing machines to prevent the motors from burning.

Even higher temperatures than 1,200 degrees could be withstood by Hot Rock, the scientists believe, but such temperatures

might cause breakdown of the metals involved. Iron, for instance, loses its magnetic properties at 1,300 degrees Fahrenheit.

The demonstration motor was equipped with special bearings wound with pure silver wire to eliminate the oxidation and other deteriorations such high heat would inflict on conventional copper wire.

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**FIRE "BATH"**—Electric motor performs even in searing heat from jets of burning gas.

## ● RADIO

Saturday, Nov. 8, 1958, 1:35-1:45 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Theodore Puck, professor of biophysics of University of Colorado School of Medicine, Denver, Colorado and an Albert Lasker Award Winner for 1958, will discuss "Cell Genetics."

## AERONAUTICS

## Air Commuting With Turbo-Prop Engine

► A TURBO-PROP engine that can be fitted into existing American two-engine airplanes, would allow departures every 20 minutes on the busy New York-Washington route.

Sir Archibald Hope, director of Napier Engines, a subsidiary of the English Electric Co., made this prediction in announcing the new engine. He foresees the elimination of costly ticketing and baggage-handling procedures.

"Under this plan," Sir Archibald said, "passengers would pay their fares as they board, carrying their own baggage, and the loaded airliners would be weighed automatically before departure. This type of operation, exploiting the benefits of the turbo-prop aircraft, would permit fares lower than present air-coach rates. The turbo-prop aircraft permits higher payloads and thus more passengers, permitting seating arrangements in aircraft similar to those in typical city buses."

The Napier Eland turbo-prop engine, specifically designed for air transport, has four replaceable self-contained units: reduction gearbox, compressor and main support plate, combustion system, and turbine. The Eland is a single shaft turbo-prop developing 3,500 E.S.H.P. for take-off.

Science News Letter, November 1, 1958

## ENGINEERING

## New Rocket Missile Tests Parachutes

► A ROCKET missile nicknamed the "Cree" has been developed by the Air Force to test parachutes at speeds of more than 3,000 miles per hour and at altitudes of 26 miles above the earth.

The missile will enable Air Force engineers and scientists to study performances of first-stage parachutes for manned aircraft escape capsules, missiles and drones. Previously, checking characteristics of these 14- to 48-inch parachutes was limited to ground level experiments at speeds of 1,216 miles per hour.

The Cree was developed for the Air Research and Development Command's Wright Air Development Center, Dayton, Ohio. Three parachutes are tested at one time by a cluster of three test missiles that are mounted parallel and propelled by a ground-to-air missile booster unit.

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## BACTERIOLOGY

# Antibiotics: More, Better

► A SOIL MOLD organism from the interior of Borneo has produced an antibiotic capable of stemming the rapid spread of staphylococcus infection that has hit numerous hospitals within the past year.

In the four years of clinical trials of the drug on more than 4,000 people no resistance to the infection-killing agent has been observed. The antibiotic is called vancomycin.

The clinical effectiveness of vancomycin may lie in the antibiotic's pronounced bactericidal effect. Dr. N. Joel Ehrenkrantz of the University of Miami School of Medicine commented at the sixth annual Antibiotics Symposium in Washington.

No resistant staphylococci, that is, infectious organisms that become immune to the antibiotic, rendering it impotent, were observed in any of the cases, the Miami physician reported.

Three Seattle doctors added support by reporting that they had encountered no resistance to the antibiotic in the two years they had been conducting extensive clinical trials of the drug.

"Vancomycin is probably the best drug now available for the treatment of severe staphylococcal infections."

Drs. William M. M. Kirby, David M. Perry and James L. Jane of the department of medicine, University of Washington School of Medicine, said.

The clinical trial material now available is well-tolerated and produces relatively few side effects, they added. The doctors tested the drug on 30 patients. The drug, developed by the Eli Lilly and Company of Indianapolis, is expected to be available commercially within the next few months under the trade name Vancocin.

## Penicillin Beaten

► THE GONOCOCCUS, the organism that causes gonorrhea, is becoming immune to penicillin.

Many countries have had an increasing attack rate of gonorrhea, Dr. R. R. Willcox of St. Mary's Hospital, London, reported to the antibiotics symposium.

Repository penicillins, those trapped in vegetable oil and wax to allow slower absorption and prolonged action, are notably less effective than formerly.

A penicillin preparation with higher peaks of penicillinemia than the peaks attained with repository preparations might be the needed dosage, the British scientist suggested.

A mixed preparation of penicillin, containing from 300,000 to 600,000 units of three types of penicillin, was tested on 95 men with gonorrhea.

Among those tested, the failure rate was 9.8% among Negroes and 5.6% in other patients. The increased failure rates in Negroes may be due to a higher reinfection rate. Perhaps it is due to a higher attack rate resulting in more frequent use of peni-

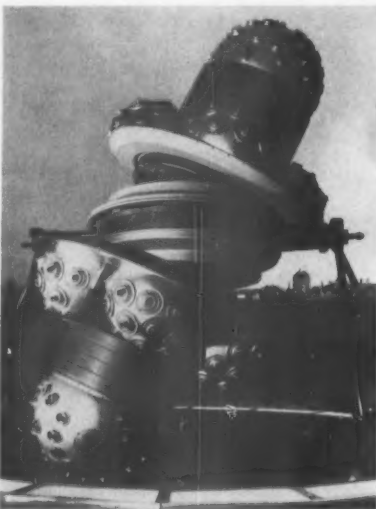
cillin. The more frequently an antibiotic is used, the greater is the chance that the organism will develop resistance to it.

Gonorrhea is spread primarily by sexual contact. The infection itself usually produces inflammation of the urinary tract, sterility, arthritis and other more remote complications.

## Zinc Improves Drug

► THE ADDITION of zinc to an antibiotic makes the drug 100 to 450 times more powerful against bacteria.

This greater effectiveness makes it possible to reduce the dosages of the anti-



**PROJECTOR**—The Korkosz projector is silhouetted against the planetarium dome.

## ASTRONOMY

## Planetarium Stars Twinkle Like Real Ones

► MORE THAN 9,500 stars, each one with a "built-in" twinkle, can be shown in a new million-dollar planetarium.

Instead of showing larger discs of light for brighter stars, the three-ton projector, designed by Frank D. and John J. Korkosz, of Chicopee, Mass., simulates for the first time in a planetarium the correct size and light intensity of actual stars.

The Charles Hayden Planetarium at the Museum of Science, Boston, Mass., also features an unusual three-dimensional skyline. Unlike the fixed variety, this hydraulically operated skyline of the neighboring area can be raised or lowered and replaced by tropical or polar horizons.

The Korkosz projector took seven years to make. It contains several projector systems in a single 13½-foot instrument.

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biotic, bacitracin, and at the same time lessen the danger of undesirable side effect.

The discovery of the zinc-enhancement was reported by Dr. Eugene Weinberg, associate professor of bacteriology, Indiana University, at the symposium.

Bacitracin is used in promoting the growth of food animals as well as in the treatment of infection.

## Small Doses Good

► SMALL BUT consistent doses of an antibiotic during 21 months caused no increase in antibiotic-resistant microorganisms in children.

Children of Haiti suffering from malnutrition were given 50 or 10 milligrams of Terramycin daily to help them grow and to stem the microorganisms in their digestive systems. Drs. Elmer E. Loughlin, Louverture Alcindor and Aurele A. Joseph of the New York Medical College and the Flower and Fifth Avenue Hospitals reported the research.

The larger of the two doses had the best growth-promoting effect. The study is part of a long term project to determine the nutritional value of small doses of Terramycin in undernourished children.

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## ZOOLOGY

## Two Birds in a Bush May Eat Bad Food

► A FINCH seems to have a better chance of choosing good food if he eats alone, a Duke University zoologist reports.

Experiments designed to test the influence of social interaction on learning rates in birds showed that single greenfinches learned with "considerably greater rapidity" than paired male-female greenfinches. Several pairs failed to discriminate at all between palatable food (sunflower seeds) and noxious food (aspirin filled seeds), Dr. Peter H. Klopfer reports in *Science* (Oct. 17).

Even a finch that has learned to avoid "bad" food will eat it if an untrained bird is observed eating it. The effect of seeing a bird feed on bad food is powerful enough stimulus to overcome previously learned avoidance behavior even after 24 hours have elapsed, Dr. Klopfer explains.

Some species of birds have a more varied diet or a "more opportunistic feeding habit" than the greenfinches. They might not be as seriously affected by this interference with discrimination learning, in social situations.

"Only among species whose feeding responses are so conservative as to virtually eliminate the likelihood of their feeding on some unsuitable or noxious food," the zoologist says, is there a possibility that this interference might not be a harmful adaptation.

Further studies of flocks of birds and birds that do have more varied diets and feeding habits should provide valuable information about the relationship between learning processes and social organization, Dr. Klopfer concludes.

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## GENERAL SCIENCE

# Science for World's Fair

► SCIENCE will be the dominant theme of the world's fair being planned for Seattle in 1961 and 1962.

Named Century 21, this projected exposition will emphasize science in all its aspects to a larger extent than Brussels and earlier world's fairs.

A committee of a score of leading scientists is already at work on plans for the two summers of operation that are planned by the instigators of Century 21. The effort is visualized as a major event for the state of Washington and the northwestern part of the nation.

One possibility being explored is an extensive display of exhibits by the leading young science students of the nation, selected from the National Science Fair to be held in 1961. This would be the 12th culmination of the national science youth program sponsored by SCIENCE SERVICE. Plans contemplate that the exhibitors in the National Science Fair coming from all parts of the nation would be invited to spend successively about two weeks demonstrating science and their achievements to the exposition visitors.

The 13th National Science Fair in 1962 would be invited to meet in May at the Century 21 Exposition. International participation by youth from all parts of the world is also planned and an international science fair is expected to be held.

With science as the prime concern of Century 21, projected plan is for a central rotunda around which will be exhibit halls in the specialized fields of science.

The science planning board for Century 21 Exposition that has been meeting with Ewen C. Dingwall, general manager, includes:

Dr. Detlev W. Bronk, president, Rockefeller Institute; Dr. Leonard Carmichael, secretary, Smithsonian Institution; Dr. Harold J. Coolidge, National Academy of Sciences; Dr. Frank Fremont-Smith, medical director, Josiah Macy, Jr. Foundation; Dr. Harry F. Harlow, department of psychology, University of Wisconsin; Dr. Donald Loughridge, General Motors Technical Center; Dr. Donald H. McLaughlin, Homestake Mining Co., San Francisco; Dr. Donald H. Menzel, director, Harvard Observatory; James Mitchell, associate director, National Science Foundation; Dr. J. C. Morris, vice president, Tulane University; Dr. Hans Neurath, department of biochemistry, University of Washington; Gerard Piel, Scientific American; Dr. Froelich Rainey, director, University of Pennsylvania Museum; Dr. Glenn T. Seaborg, University of California; Dr. Frederick Seitz, University of Illinois; Dr. Henry Bradford Washburn, Jr., director, Boston Museum of Science; Dr. Paul Weiss, Rockefeller Institute; and Dr. Dael Wolfe, American Association for the Advancement of Science.

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## ENGINEERING

## New Radar System "Sees" All Ways

► A RADAR system that can "see" in all directions at the same time has been developed at Ohio State University.

The system comprises a number of detectors, each with a horizontal and vertical range of about four and one-half degrees. How large a sector it watches depends upon the number of detectors used. Greater de-

pendability is afforded this "radarvision" than currently-used radar systems because the remainder of the channels will continue to function even though one of the detectors fails.

Signals from all objects within range of the system are gathered and displayed simultaneously on an oscilloscope screen.

Radarvision was developed at the University's College of Engineering Antenna Laboratory by Prof. William C. Davis, and R. W. Masters, now with the Boeing Airplane Company at Seattle, Wash.

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## HEMATOLOGY

## Cypriots' Blood Groups Ethnically Like Turks'

► BLOOD TYPES among the island of Cyprus inhabitants indicate that the Cypriots ethnically most closely resemble their Asian mainland neighbors, the Turks and Lebanese, Dr. P. A. Clearkin, pathologist at the General Hospital in Nicosia, Cyprus, reports in the *British Medical Journal*, Oct. 18).

This discovery followed several attempts by the British and Red Cross to establish donor blood banks throughout the island.

The world's most common blood group, type O, was found in a smaller proportion of the population than was expected. On the other hand, type A, usually the second most frequently found group, led the list as most abundant. In addition, an unusually low number of Rh negative types were found on the island.

When results of a study of native Greeks, Turks and Lebanese were compared with the Greeks and Turks on Cyprus, it was found that the Cypriots' odd blood groups more closely resembled the grouping of the Asian mainland neighbors, not the European Greeks' more common grouping.

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## ENGINEERING

## Booster Engines Provide Thrust for Moon Shoot

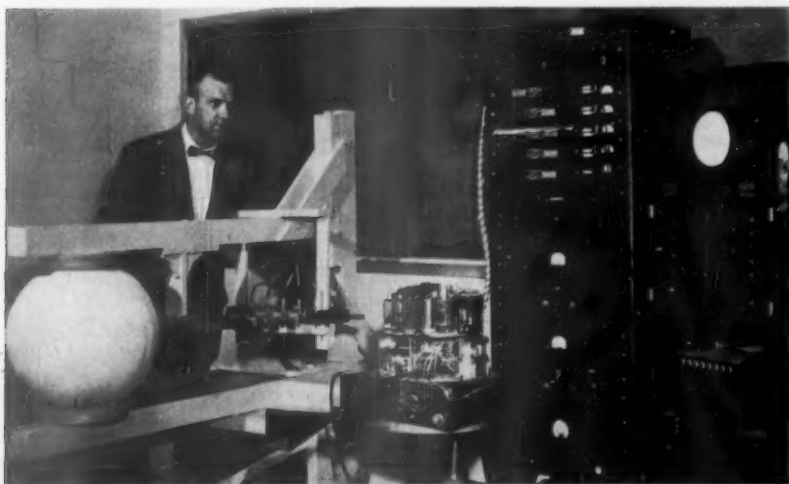
### See Front Cover

► IN THE U. S. Air Force's lunar probes, the Thor booster is responsible for approximately three-quarters of the total thrust needed for successful completion of the mission.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the performance of the main rocketdyne engine for the Thor IRBM being checked out together with the firing of twin vernier engines, which are used for supplemental thrust and directional control.

The test was conducted at the Propulsion Field Laboratory of Rocketdyne, a division of North American Aviation, Inc. (See SNL Oct. 25, p. 262.)

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**RADARVISION**—Prof. William C. Davis adjusts a detector on the "radarvision" he helped develop at the Ohio State University Antenna Laboratory. The all-direction radar transmits pulses from the horn (foreground). Picked up by the detectors, they pass through the Luneberg lens (left) and form a "map" on the oscilloscope screen (right).

Turkey has been the original home of alfalfa since the time the Persians marched across southwest Asia in 480 B.C. taking to Greece the seeds of the leguminous forage plant, which the Arabs later named "alfacacah."

## GEODESY

## Hydrogen Atom Measures Magnetic Field

► **THE PROTON**, nucleus of the hydrogen atom, has been harnessed to measure the horizontal and vertical forces of the earth's magnetic field.

Rear Adm. H. Arnold Karo, director of the Coast and Geodetic Survey, has reported that a new instrument, the "proton vector magnetometer," has been successfully tested at the Survey's Fredericksburg (Va.) Magnetic Observatory.

The improved version of the magnetometer also has potential applications in such fields as oil explorations and oceanographic investigations. Earlier versions have been used in rockets and miniaturized models are scheduled for use in satellites.

The previous instruments were capable of measuring only the overall force of the earth's magnetic field, not the direction. The magnetometer, developed by James H. Nelson of the Survey staff, can measure with great precision the magnetic force in both a horizontal and vertical direction, as well as the overall intensity.

By using polarizing electric coils around a plastic cup containing about a pint of distilled water, the instrument introduces a magnetic field that causes the spinning protons of the hydrogen atoms to whirl at right angles with the earth's magnetic field, instead of in line with it as they normally do.

When the induced magnetic field is eliminated, the protons gradually return to their normal path, creating a small alternating current as they do so. The frequency of this current, which can be precisely measured, is directly related to the magnetic field strength.

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## GENERAL SCIENCE

## Antarctic Will Thrive During This Generation

► **THE ANTARCTIC** will be a useful, thriving continent during the lifetime of some persons living today, one of the South Pole's most widely known living explorers has predicted.

The now barren wasteland covered with ice and snow 200 feet to two miles deep will become a valuable world weather station, a "safe" generating plant for atomic energy and an almost unlimited source of pure water, Dr. Paul A. Siple, scientific director for environmental research, U. S. Army, told the National Security Industrial Association meeting in Washington.

The one-time Boy Scout who accompanied Adm. Richard E. Byrd on an Antarctic expedition 30 years ago told the assembled defense contractors that "after a few more accidents" we will start searching for a safe spot in which to operate our nuclear power reactors. He envisioned the southernmost frozen continent as ideal in the event of a reactor accident.

"In the long run," he said, "we can't trust to the foolproofness of man to prevent ac-

cidents that could be disastrous. After a few more accidents the manufacturing of atomic energy will have to be carried on in a safe place where there is a minimum of consequential life and where the waste products can be safely stored for milleniums. Antarctica has providentially been preserved for mankind to fill this need."

Dr. Siple pointed out that, in addition to providing power for the presently civilized areas of the world, Antarctic nuclear power plants would also produce for the needs there. With an abundance of power to transform the wasteland into a land of productivity, the huge continent could someday become a major civilization center.

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## MEDICINE

## Treat Strokes With Surgery Outside Brain

► **STROKES** are not always caused by blockage of one of the small arteries in the brain. Other arteries may be to blame.

In many cases, Dr. E. Stanley Crawford of Baylor University reported at the American Heart Association meeting in San Francisco, strokes can be effectively treated through surgery outside the brain.

X-ray studies of arteries have shown that blockage is often located in an artery of the neck or upper torso. When this happens, Dr. Crawford said, the same surgical procedures used for circulatory deficiencies in the arms, legs and elsewhere can be applied.

Normal circulation has now been restored in a majority of 50 patients suffering from paralysis, loss of speech, convulsions, and other disorders, by operating on blocked arteries supplying the brain. Best results were obtained in patients who had had small recurrent attacks and in those who were treated soon after the beginning of their illness.

"It is felt that a curative form of treatment is now available for many people with strokes," Dr. Crawford concluded. The research team that made the study included Drs. Michael E. De Bakey, Denton A. Cooley and George C. Morris, Jr., all of Baylor University.

Dr. De Bakey also reported a "better than 90% success in restoring circulation to the lower parts of the body through surgery on clogged arteries."

Improved X-ray techniques and blood vessel grafting procedures were said to be the key to surgical success in most of the 957 patients undergoing surgery. In general, Dr. De Bakey said, best results can be expected when clogging is high up in the arterial network where vessels are larger.

According to the particular case, a surgeon may determine to use a graft, cut out a diseased segment of an artery or to remove occluding clots from the artery walls. Sometimes, where the obstruction is widespread and extends into the finer vessels rather than with open arteries sufficiently large to allow a graft to be attached, surgery may be limited to cutting certain nerves to help relieve discomfort.

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# IN SCIENCE

## PHYSIOLOGY

## Color Vision Studies Confirm "Sex Reversal"

► **COLOR BLINDNESS** studies confirm theories that some males have two "X" chromosomes and are therefore female so far as nuclear or genetic sex is determined.

The findings confirm earlier theories on the role of "sex chromatin" in determining sex. Its presence apparently indicates XX chromosome combination for female and its absence indicates XY chromosome combination for male.

Since major red-green color vision defects are genetically determined and much more common among males, scientists were able to use color vision tests to check on the genetic sex of individuals. Patients with Klinefelter's syndrome, a condition characterized by male sterility, were tested and found to have "significantly different" color vision from normal males, a group of scientists reports in *Nature* (Oct. 18).

It is difficult to draw conclusions about the sex of individuals from studies of their sex chromosomes, the scientists point out, because there can be so many chromosome anomalies or irregularities even in normal individuals. The color tests can help make correct inferences concerning the X chromosomes present in cases where there is a discrepancy between external appearances and nuclear sex.

The scientists reporting the research are P. E. Polani and P. M. F. Bishop, Guy's Hospital, London; B. Lennox, M. A. Ferguson-Smith, J. S. S. Stewart, Western Infirmary, Glasgow; and A. Prader, Kinderspital, Zurich, Switzerland.

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## PSYCHOLOGY

## "Lip" Reading Involves Entire Body, Gestures

► **SUCCESSFUL LIP** reading involves more than just watching the lips alone.

Facial expressions, body movements and gestures play a much more important role in face-to-face communication than has been thought.

Audible speech is only a part of an overall "sign" process that constitutes human face-to-face communication, Dr. Louis Stone, clinical psychologist at the University of California at Los Angeles, said.

His conclusions are based upon responses of UCLA students with normal hearing who were untrained in the art of lip reading. They were shown silent films in which an actor spoke while his face and torso were gradually unmasked. More information was communicated as more of the face and body was seen.

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# CE FIELDS

## ASTRONAUTICS

### Space Travel Propulsion Problems Being Licked

► THE PROBLEMS of providing thrust for interplanetary travel are being licked, Dr. H. S. Seifert of the Space Technology Laboratories, Los Angeles, has reported.

At least ten companies can say, "Have rocket—will travel," Dr. Seifert told a University of Maryland audience. The next problem is to develop a man-carrying rocket, which will require an as yet non-existent million-pound thrust engine.

The chemical rocket will have reached the ceiling of its performance when it has improved specific impulse by another 25% beyond today's models. For greater thrusts, an energy source such as a nuclear reactor must be used to power the exhaust jet.

Although the problems of operating a nuclear reactor to propel a space vehicle are "formidable," Dr. Seifert said, nuclear research workers believe they can be licked.

A third type of interplanetary propulsion, the ion rocket, is "clean and dainty." It will produce only a small thrust and will operate only in the near-vacuum of interplanetary space.

Dr. Seifert concluded that propulsion, which has been the limiting factor in space travel until now, may soon yield that distinction to guidance and communication.

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## MEDICINE

### Pain-Relief Surgery Increases Life Span

► SOME HOPELESSLY ill cancer patients, operated on merely for temporary relief of pain, have survived in good health for surprisingly long periods.

The results of such surgery on several hundred patients were described by Dr. H. E. Lockhart-Mummery of St. Mark's Hospital, London, at the annual American Cancer Society meeting in New York.

Concerning 268 patients who had undergone palliative operations for rectal cancer, Dr. Lockhart-Mummery said, "We were surprised to find that 24 had lived more than five years since their operations . . ."

An average survival of 20 months was achieved with another group of patients suffering from colon cancer.

Dr. Lockhart-Mummery, who with his St. Mark's colleagues has performed hundreds of such operations during the last 30 years, credited much of the success to "the improvements in surgical technique, anesthesia and supportive care which have occurred during this time."

In 1928, St. Mark's surgeons operated on only 50% or 60% of the patients with cancer of the rectum or colon. Today they find it worthwhile to operate on more than 93%.

In some cases, where the cancer has

spread to other organs, usually a sign that the patient has little time to live, surgical removal of the diseased parts of the organ have prolonged life. Dr. Lockhart-Mummery noted 16 cases in which surgeons removed parts of the liver exhibiting growths caused by the spread of bowel cancer cells. Twelve survived the operations; and their average survival so far is 2.7 years. Four patients are still living.

He said most surgeons now agree that removal of the bowel tumor is advisable where possible, even when the outlook is hopeless because of the cancer's spread. This operation, he suggested, will in many cases relieve painful symptoms, prevent other symptoms that might end life, give psychological benefit, improve general health and well-being, and prolong life.

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## SURGERY

### Stress in Pregnancy May Cause Birth Defects

► MATERNAL STRESS during pregnancy appears to be a more important factor than heredity in the cause of birth defects in the infant.

This opinion was expressed by Dr. Lyndon A. Peer of St. Barnabas Rehabilitation Center in Newark, N.J., speaking at the American Society of Plastic and Reconstructive Surgery meeting in Chicago.

Efforts to prevent defects, such as cleft lip and palate, have been hampered in the past by the belief that heredity was the sole cause, Dr. Peer said. Birth defects may occasionally be prevented, he said, if stress factors, such as insufficient oxygen, exposure to X-ray, virus infection, vitamin deficiency and the overproduction of adrenal cortisone, could be discovered and eliminated.

Dr. Peer reported hereditary influences could be traced in about one in every four infants born with a cleft palate and lip. In the other three-fourths, hereditary tendencies are probably reinforced by one or more stress factors.

His own experiments have shown Dr. Peer that administration of large amounts of the vitamins folic acid and B-6 prevented cleft palate in mice. As a result, he has administered these vitamins to pregnant patients who have previously given birth to babies with cleft palates, in order to determine the vitamins' ability to prevent the defect from recurring.

Although it is still too early for significant results, thus far all offspring of these mothers have been normal.

Animal experiments have revealed that the type of deformity in the infant depends on what organs are being formed at the particular stage of pregnancy in which the maternal stress occurs.

In another address at the society's meeting, Dr. Thomas Ray Broadbent of Salt Lake City reported on a palate lengthening operation called a pharyngeal flap, in which a flap of soft tissue from the throat wall is attached to the back of the soft palate. The reason for lengthening the palate is to produce better speech in many children born with cleft palates or abnormal short palates.

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## MEDICINE

### New Fluoroscope Screen Is Brighter and Safer

► A FLUOROSCOPE screen, which gives a much brighter image than conventional screens and decreases the patient's exposure to X-rays, has been developed by Georges Destriau, consultant to Westinghouse Electric Corporation and a professor at the University of Paris.

It is now possible for the physician to fluoroscope his patient, remove him from the apparatus, and then make the image reappear on the screen by turning on the X-ray again. The screen can retain the image for 17 hours. During this time the physician can make the image reappear once for one-half minute. On reexamining the screen in the absence of the patient, the X-ray can be turned on with greater intensity, thus resulting in an image at least twice as bright as on conventional screens.

Similarly, a reappearing image of conventional brightness can be obtained after fluoroscoping a patient with reduced radiation, thereby lessening the danger of overexposure to the patient.

The screen's image retention is possible because an electric field made to pass across the surfaces of two glass plates in the screen affords more light. In the past, response of fluoroscopic screens to X-rays has been impaired rather than improved by simultaneous application of an electric field.

Since the patient does not stand by the screen during the image's reappearance, the new screen is mainly useful for viewing non-moving parts of the body. Then the brighter image permits viewing in a lighted room and greater perception of detail. Also, the relatively high intensity of the image might make the screen useful with an industrial type TV system where remote viewing is desired.

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## ASTRONOMY

### If Comet Hit Earth: Equal to Million A-Bombs

► A COMET HEAD colliding with earth would generate energy equivalent to a million or more atomic bombs exploding simultaneously.

This estimate of Dr. Harold C. Urey, Nobelist of the Scripps Institution of Oceanography, La Jolla, Calif., was reported to support his theory of a comet source for tektites. Dr. Urey's report appears in *Nature* (Oct. 18).

Dr. Urey believes tektites are associated with the impact of material from comets. Comet heads should occasionally collide with earth, he suggests, producing effects resembling the glass formed from the sands of Alamogordo, N. Mex., when the first atom bomb was exploded.

He said such collisions would "result in a flame-like mass of gas at a very high temperature capable of volatilizing the comet head." Bits of melted terrestrial materials (tektites) would be scattered over large areas by the high pressures developed by the impact.

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## FORESTRY

# Autumn's Red and Gold: Fire

**Forest fire fighters face two major problems: controlling and extinguishing existing fires and learning more about the basic science of fire.**

**By BENITA TALL**

➤ A BOLT of lightning can turn the red and gold of autumn leaves into searing flames, destroying timber, land and wild-life.

A bolt of lightning or human carelessness in the shape of an untended brush fire or a smoldering campfire is the nemesis of a group of workers in the U.S. Forest Service. Rangers, researchers, smoke jumpers, fire fighters are all devoted to solving the problem of the forest fire.

A problem it is in every sense of the word. In the Atomic Age, with nuclear energy flowing into the nation's power supply and rockets being hurled into space, we still do not know how forest fires burn nor how they can be controlled.

Through the years forest fires have taken a toll in human lives and natural resources destroyed that is all but impossible to imagine. Billions of acres of trees either have been destroyed outright by fire or so weakened by the flames that they cannot withstand bad weather conditions or attacks by insects. Valuable watersheds have been lost when fire burned over the land leaving charred ruins where there had been green plants. Forest fire fatalities from 1948 through 1957, from national forests, interior lands, and state and private lands, totalled 188 persons.

## A-Bomb vs. Fire

When you realize that the energy released in burning just 40 acres of medium density brush is about equal to the energy released by the first atomic bomb exploded at Hiroshima, you have some idea of the power unleashed in a forest fire.

There are two aspects to the problem of these fires. One has to do with the basic chemistry and physics of fire and fuels, and with meteorology; the other is concerned with controlling and extinguishing fire.

Taking the second part of the problem first—about which the most is known—it is possible to point to many advances.

Until recently, forest fire fighters had only water, shovels and more fire as weapons against flames sweeping through the woods. They could smother the fire with water and dirt, dig trenches to bar its spread, or build controlled fire walls to burn off potential fuel for the approaching flames. Today the fire fighters have airplanes, aerial tankers, fire retardants and smoke jumpers. Air support of the ground workers trying to control a fire is now an extremely important phase of fire fighting.

It is difficult to say when the air attack on forest fires began. As early as the 1920's

serious thought was given to fighting fires by dropping water from aircraft. Actual "firsts" were made in 1936 when the Forest Service used planes to supply hard-to-get-to fire camps and in 1939 when smoke jumping began. Helicopters were first used in forest fire fighting in 1947 in California, a year after their introduction in Canadian forest fire fighting.

Air tanks, chemical air attack and "helitack" are the three main parts of the Forest Service's airborne attack on fire.

Airplanes equipped with one or more tanks with large gates to "cascade" thousands of gallons of uncontained liquid (both water and retardants have been used) are credited with controlling several serious fires in their first trials.

Chemicals are an especially promising part of air attack on fire. Sodium calcium borate, mixed about four pounds per gallon of water until it has a pancake batter consistency, is currently considered as the most suitable of the chemical fire retardants. It gives good coverage of the land and vegetation. In addition to making potential fuels, bushes, leaves, etc., virtually impervious to fire, the white borate covering is

helpful since the airplane pilot can readily see where previous applications of retardant have been made.

Chemical fire retardants act in such a way as to interfere with the chemical processes essential to combustion. Experimental work at Stanford Research Institute, California, indicates that the halogen compounds, especially those containing bromine and iodine, may be particularly useful as fire fighters.

These halogen compounds break down at the high temperatures found in flames and release free iodine or bromine atoms. These atoms then combine with highly reactive chemical fragments—radicals—in the flame that are needed if combustion is to take place. By interfering with the radicals, the flame is inhibited and eventually extinguished.

The use of helicopters in tactical support of ground forces in forest fires is what "helitack" means. The 'copter is an excellent tool for scouting and finding fires, for quick transportation of men and supplies, and for laying hose. In one test, a helicopter took 53 seconds to lay 1,500 feet of hose up a steep hill, a job that took eight men 30 minutes.

Two new fire research laboratories may soon be providing the Forest Service some answers to the basic science of fire.

One laboratory is already being built at Macon, Ga.; the second, at Missoula,



**FIRE FIGHTER'S FERRY**—A helicopter takes off for a distant fire, in Bichota Canyon, Angeles National Forest, California, ferrying a fire fighter to the scene of action and thus saving precious time and timber.

Mont, where there is a smoke jumping school, the Missoula Smokejumper Center, is going up soon. These laboratories will have wind tunnels, controlled temperature and humidity rooms, electric ovens and other facilities for physical and chemical research.

Scientists hope to identify the separate fuel types in which fires perform in characteristic ways. They also hope to learn what natural laws affect fire in the woods and why fire responds in certain ways to weather. The flammability of different types of vegetation under various atmospheric conditions will receive considerable attention in the new laboratories.

As one of their main projects, researchers at the Macon laboratory, headed by K. W. McNasser, chief of fire research at the Southeastern Forest Experiment Station, will study what makes some fires "blow up" without warning. With information on this, foresters could predict fire behavior and plan their control strategy better.

## Controlled Burning

With all the work toward forest fire prevention and control continuing there remains some evidence to support the theory that a little controlled burning may be good.

In primitive times, lightning fires were free to burn. Also, Prof. H. H. Biswell of the University of California recently pointed out, the Indian sometimes used fire as a tool for shaping his landscape, hunting game and driving away the enemy. As a result, the pine forests in the Sierra Nevada, for example, were open and park-like. The modern policy of fire suppression results in a gradual build up of fuel on the forest floor and a constant danger of destructive wildfire, the California ecologist believes.

Today, however, with man's carelessness one of the chief factors in causing forest fires, we probably have a long way to go before we can plan on using extensive controlled burning to help prevent fires. Fire is not yet, and not always, the useful tool it should be. It still holds secrets for scientists to learn.

Science News Letter, November 1, 1958

## METEOROLOGY

## Lowest Temperature Found Above South Pole

► A TEMPERATURE OF 135.4 degrees below zero Fahrenheit, believed to be a world's record low at any height anywhere, was recorded 13 miles high in the air above the South Pole on July 16, the U.S. Weather Bureau has reported.

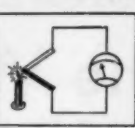
The record low is about three degrees below the previous low, which was also established by a balloon-carried instrument in the Antarctic stratosphere.

The world's lowest temperature for a ground station is claimed by Russians in Antarctica, who recorded 124.1 degrees below zero Fahrenheit on Aug. 9 at Soviet-skaya, at a height of 12,000 feet above sea level.

Science News Letter, November 1, 1958

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**ADVANCES IN GEOPHYSICS**, Vol. 5—H. E. Landsberg and J. Van Mieghem, Eds.—*Academic*, 325 p., illus., \$10. Survey of Polar Years to IGY, on microseisms, oceanic tides, ultraviolet absorption process in the upper atmosphere, and the physics of cloud modification. Bibliographies.

**THE ART OF NAVIGATION**: In England in Elizabethan and Early Stuart Times—D. W. Waters, foreword by the Earl Mountbatten of Burma—*Yale*, 696 p., illus., \$12.50. A British Admiralty historian sets down the development of navigation in the 16th and 17th centuries.

**THE AZTECS**: People of the Sun—Alfonso Caso, transl. from Spanish by Lowell Dunham—*Univ. of Okla. Press*, 125 p., illus. by Miguel Covarrubias, photographs, \$7.95. An account of the Aztec people, their art, customs, religion and practice of magic.

**BALLOONING IN THE SPACE AGE**—Lynn Poole—*Whittlesey House*, 160 p., illus. by Gustav Schrotter, \$3. The history of free ballooning from Montgolfier in 1783 to the thin-gauge plastic balloons of today.

**CORAL ISLAND**: Portrait of an Atoll—Marston Bates and Donald P. Abbott—*Scribner*, 254 p., illus., \$4.95. The story of a scientific expedition on Ifaluk Atoll, half a square mile of inhabited coral reef in the Pacific.

**A FIELD GUIDE TO REPTILES AND AMPHIBIANS**: Of the United States and Canada East of the 100th Meridian—Roger Conant—*Houghton*, 366 p., illus. by Isabelle Hunt Conant, \$3.95. Includes every species of turtle, alligator, lizard, snake, newt and frog in eastern North America.

**A GUIDE FOR HIGHWAY SALVAGE PROGRAMS IN ARCHAEOLOGY, HISTORY AND PALEONTOLOGY**—Fred Wendorf, Chairman—*Committee for Highway Salvage Archaeology*, 14 p., paper, free upon request direct to publisher, P.O.B. 1727,

Santa Fe, N. M. Describes cooperative program of U. S. Bureau of Public Roads, N. M. State Highway Dept. and Museum of New Mexico.

**HOME CARE IN ARTHRITIS**: A Handbook for Patients—*Arthritis and Rheumatism Foundation*, 24 p., illus., paper, free upon request direct to publisher, 10 Columbus Circle, New York 19, N. Y.

**THE METALLURGICAL, CHEMICAL AND OTHER PROCESS USES OF COAL**—R. A. Glenn and H. J. Rose—*Bituminous Coal Research*, 64 p., illus., \$3. Survey of yields, unit fuel and power consumption, typical end products and their uses.

**PATTERNS OF DISCOVERY**: An Inquiry into the Conceptual Foundations of Science—Norwood Russell Hanson—*Cambridge Univ. Press*, 241 p., illus., \$5.50. Essay stresses philosophical aspects of microphysical thinking.

**PERSPECTIVES IN MARINE BIOLOGY**—A. A. Buzzati-Traverso, Ed.—*Univ. of Calif. Press*, 621 p., illus., \$10. Papers presented at a symposium held in 1956 at Scripps Institute of Oceanography.

**PRACTICAL CHEMISTRY FOR SCHOOLS**—C. Jenkins—*Cambridge Univ. Press*, 222 p., illus., \$1.75. Series of experiments for junior high and high school level.

**RADIATION BIOLOGY AND MEDICINE**: Selected Reviews in the Life Sciences—Walter D. Claus, Ed.—*Addison-Wesley* for the U. S. Atomic Energy Commission, 944 p., illus., \$11.50. Advances in the use and effects of nuclear radiation in the life sciences, presented at Geneva Conference.

**SCHIZOPHRENIA**—Manfred Sakel—*Philosophical Lib.*, 334 p., illus., \$5. Describes the insulin shock therapy for schizophrenia which the late author introduced in 1927.

**SCIENCE NEWS** 49—Archie and Nan Clow, Eds.—*Penguin*, 126 p., illus., paper, 65¢. Articles on gravitational waves, silicones, bubble chambers, and reports on British research.

**SCIENTIFIC USES OF EARTH SATELLITES**—James A. Van Allen, Ed.—*Univ. of Mich. Press*, 2nd rev. ed., 316 p., illus., \$10. Handbook of experiments proposed and executed in the U. S. program of scientific observations with satellites.

**A SCIENTIST OF TWO WORLDS**: Louis Agassiz—Catherine Owens Pearce—*Lippincott*, 188 p., illus., \$3. Story of the great naturalist and teacher told for young people.

**SEX AND THE ADOLESCENT**—Maxine Davis, foreword by J. Roswell Gallagher—*Dial Press*, 317 p., \$5. A guide for young people and their parents.

**STATISTICS AND TIME DEPENDENCE OF MECHANICAL BREAKDOWN IN FIBERS**—Bernard D. Coleman—*Mellon Institute*, 15 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

**TECHNICAL EDUCATION AND SOCIAL CHANGE**—Stephen F. Cotgrove—*Allen & Unwin (Essential Bks.)*, 220 p., \$3.50. Analysis of the various social factors which have influenced the recruitment of students to the technical colleges in England, with discussion of the future.

**THE TEEN-AGE DIET BOOK**—Ruth West—*Messner*, 180 p., illus. by Don Trawin, \$3. Emphasizes the importance of both activity and a well-balanced diet for the adolescent.

**THERE'S ADVENTURE IN CIVIL ENGINEERING**—Neil P. Ruzic—*Pop. Mechanics*, 187 p., illus. by Frank C. Murphy, \$2.95. Acquaints boys with the problems of the builders of the Pan-American Highway.

**TRACE ELEMENTS**—C. A. Lamb, O. G. Bentley and J. M. Beattie, Eds.—*Academic*, 410 p., illus., \$12. Proceedings of conference held in 1957 at Ohio Agricultural Experiment Station, Wooster, Ohio.

**U. S. RESEARCH REACTOR OPERATION AND USE**—Joel W. Chastain, Jr., Ed.—*Addison-Wesley* for U. S. Atomic Energy Commission, 366 p., illus., \$7.50. Presented at the Geneva Conference, September 1958.

**WEATHER AND CLIMATE**—Clarence E. Koeppe and George C. De Long—*McGraw*, 341 p., illus., \$7.50. Non-technical college-level treatment of modern weather principles and processes.

**WHAT MAKES IT GO?**—Rose Wyler and Gerald Ames—*Whittlesey House*, 64 p., illus. by Bernice Myers, \$2.50. All kinds of machines, from roller skates to rockets, explained in simple language and with clever drawings.

**THE WORLD OF SCIENCE**: Scientists at Work Today in Many Challenging Fields—Jane Werner Watson, foreword by Ernest C. Watson—*Simon and Schuster*, 216 p., color photographs, diagrams, \$4.95. Modern picture book describing scientific processes and equipment.

Science News Letter, November 1, 1958

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The scientists attacked the problem by conducting a thorough study of the capabilities of semiconductor junction diodes. These studies led to the conclusion that junction diodes could be made to amplify efficiently at UHF and microwave frequencies. This was something that had never been done before. The theory indicated that such an amplifier would be exceptionally free of noise.

At Bell Laboratories, development engineers proved the point by developing a new kind of amplifier in which the active elements are junction diodes. As predicted, it is extremely low in noise and efficiently amplifies over a wide band of frequencies.

The new amplifier is now being developed for U. S. Army Ordnance radar equipment. But it has numerous other possibilities. In radio astronomy, for example, it could be used to detect weaker signals from outer space. In telephony, it offers a way to increase the distance between relay stations in line-of-sight or over-the-horizon communications.



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## Questions

**ASTRONAUTICS**—How much would the projected space sailboat weigh, not including its payload? p. 277.

**BACTERIOLOGY**—What is one microorganism that is becoming resistant to penicillin? p. 278.

**MEDICINE**—In what ways is the new fluorescence screen better? p. 281.

**OPTICS**—How much magnification can the lower compound lens sector of the new eye-glass produce? p. 275.

Photographs: Cover, Rocketdyne-North American Aviation Inc.; p. 275, Dr. William Feinbloom; p. 277, Westinghouse Research Laboratories; p. 278, Museum of Science; p. 279, Ohio State University; p. 282, U. S. Forest Service; p. 288, Eastman Chemical Products, Inc.

## Do You Know?

An overdose of *somatotropin*, the growth hormone produced by the body's pituitary or "master gland," produces diabetes in animals.

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❁ **HEARING AID** attached to eyeglasses transmits sound through the mastoid bone into the inner ear. Nothing is worn in the ear itself. A new self-adjusting sound plate on the hearing aid temple bar eliminates the need for cords, wires, ear buttons and molds.

Science News Letter, November 1, 1958

❁ **ELECTRICAL OUTLET COVERS** keep children from tampering in this dangerous home area. The plastic covers are screwed into place over the outlets and are hinged so that they may be swung open for insertion and removal of electric plugs. The hinged lid is fastened shut by friction catches.

Science News Letter, November 1, 1958

❁ **AQUATIC MOUSETRAP** can, with one setting, catch more than 100 mice. The mouse is enticed into the steel trap by smell of food in an inaccessible chamber. Searching for the food, it passes through a series of ramps and dumping mechanisms actuated by its own weight. Finally, it falls into a water chamber. The trap is 15½ by 3 by 15 inches and weighs 12 pounds.

Science News Letter, November 1, 1958

❁ **DOUBLE-ENDED CUP** measures liquids and solids. Made of plastic and including a common handle, the combination cup,



shown in the photograph, may be used for liquid and dry measuring. One end is a two-cup measure and the other is a one-cup measure. Each side is marked in fractional cups and ounces.

Science News Letter, November 1, 1958

❁ **SPOUTING WHALE** bathtub toy has a nylon-gear motor with a permanently attached key. It is 10½ inches long and is made of plastic. A flapping tail drives the

toy and an internal pump spouts water at the same time.

Science News Letter, November 1, 1958

❁ **KEY HOLDER** can hold up to 16 keys identified by tabs. It closes like a book and measures 4½ by 6 inches. Each tab has a transparent cover under which is inserted an identification card. There are eight tabs, each holding two keys.

Science News Letter, November 1, 1958

❁ **ROOM VENTILATOR-FILTER** fits into windows. A plastic foam filter provides draft-free, steady flow of air into rooms and removes 79% of airborne dirt and dust. The aluminum ventilator is seven inches high and fits a standard window 18 to 35 inches wide. The filter rinses clean under running water.

Science News Letter, November 1, 1958

❁ **LENTICULAR SCREEN SURFACE** permits projection of slides and movies in normally lighted rooms as well as darkened rooms. It has a silver surface and holds its brightness over an area as wide as 120 degrees. The surface is truly lenticular because it combines both vertical and horizontal grooves, thus controlling light reflection in all directions. The screen comes in four sizes.

Science News Letter, November 1, 1958



## Nature Ramblings



By HORACE LOFTIN

➤ **CHILLY AUTUMN** is here in full force and winter is hard on her tracks.

The frost has seared the summer's greenery. Throughout much of the nation broad-leaved trees have had their day of riotous color. Now their leaves are falling to cover the earth in a blanket for nature's winter sleep.

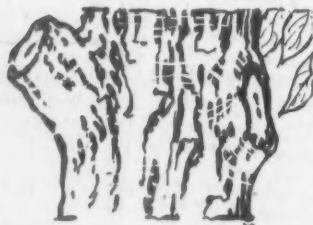
These are the external signs of winter's nearness. There are also internal, hidden signs.

During the summer, our trees added measurably to their girth by regular growth. Now this has largely ceased, and a layer of harder wood is forming to mark where the season's growth came to a halt.

In most cases, one such growth ring is laid down for each year of a tree's life. So if the year is known in which a tree is cut, its age can be determined merely by counting the number of growth rings in a cross section of its trunk.

(This, of course, holds true only where

### Tree Trunk Secrets



there is a sharp division between the growing and resting seasons. In many areas of the country, there may be some growth every month of the year to complicate the picture.)

These growth rings are far from being all of the same width. From one ring to the next, they may vary anywhere from extremely narrow to very broad, depending on the kind of growing seasons the tree encounters. In good growing years, the

growth rings are broad; when the summer is dry or cold, the ring is proportionately narrower. Therefore, a tree trunk keeps a permanent annual record of the weather it has known throughout its life.

All the trees in a given area tend to show the same relative differences in width of growth rings laid down in identical years. If you have a distinct pattern of growth rings in one of these trees, you should be able to locate a similar pattern in another of the trees. Then, if the age of one of these trees is known, it is possible to date the years in which that special ring pattern was laid down. By counting from this pattern in the other tree, the second tree's age can be determined.

By tracing growth ring patterns backwards through trees of greater and greater age, then to the patterns of hewn beams of prehistoric Indian dwellings, scientists in the American Southwest have been able to date these ancient timbers as having been cut by the Indians as far back as 11 A.D.

Science News Letter, November 1, 1958

